



Lee, G. R. H., Berstock, J. R., Whitehouse, M. R., & Blom, A. W. (2017). Recall and patient perceptions of hip precautions 6 weeks after total hip arthroplasty. *Acta Orthopaedica*, 1-4.
<https://doi.org/10.1080/17453674.2017.1350008>

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To cite this article: George R H Lee, James R Berstock, Michael R Whitehouse & Ashley W Blom (2017): Recall and patient perceptions of hip precautions 6 weeks after total hip arthroplasty, Acta Orthopaedica, DOI: [10.1080/17453674.2017.1350008](https://doi.org/10.1080/17453674.2017.1350008)

To link to this article: <http://dx.doi.org/10.1080/17453674.2017.1350008>



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Recall and patient perceptions of hip precautions 6 weeks after total hip arthroplasty

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Submitted 2017-01-09. Accepted 2017-05-05.

Background and purpose — There is a lack of evidence to support the role of hip precautions in preventing dislocation following total hip arthroplasty (THA). We report an exploratory study which assesses recall, adherence, and the impact of precautions on activities of daily living in the first 6 weeks postoperatively.

Patients and methods — We designed a new questionnaire based on the education patients receive and refined by professionals within our multidisciplinary team. 129 patients underwent primary elective THA during the study period and received the questionnaire at 6 weeks postoperatively.

Results — 97 (75%) patients responded before the 8th week postoperatively. Most of these (83 patients) could remember all the precautions. Of the 97 who responded only 22 claimed to adhere to all of the precautions. 48 admitted to putting their own underwear on without the use of aids or assistance, and 38 had started walking without an aid. Due to the precautions 67 avoided leaving the house at some point and 63 were unable to perform desired activities. 84 stated that their sleep was affected. There were no dislocations among the 97 patients who responded; however, there was 1 dislocation among the 32 non-responders.

Interpretation — We found that most patients did not adhere to hip precaution advice. Precautions have a detrimental effect on patient activity and sleep. In view of the limited efficacy in reducing dislocation rate, we question the use of precautions in the primary arthroplasty setting.

Hip precautions were introduced to reduce the risk of early dislocation following total hip arthroplasty (THA) by restricting certain movements until soft tissue healing has at least partly occurred. The resources invested in educating and equipping patients to follow these precautions may be substantial. Advances in surgical technique (Pellicci et al. 1998), compo-

nents and improved component positioning have reduced the rate of dislocation (Archbold et al. 2006).

The effectiveness of hip precautions in preventing dislocation is unknown. Evidence is emerging to suggest that hip precautions do not reduce the rate of dislocation (Talbot et al. 2002, Peak et al. 2005, Ververeli et al. 2009, Schmidt-Braekling et al. 2015, Kornuijt et al. 2016, van der Weegen et al. 2016). Patients' recall of, adherence to, and the impact of these precautions on activities of daily living have not been determined. A recent Cochrane review has called for future research into patient adherence to these protocols (Smith et al. 2016).

At 6 weeks postoperatively we assessed patient recall of the hip precautions they had been taught preoperatively, and determined the rates of patient-reported compliance with the precautions and whether precautions led to activity restriction or affected sleep.

Patients and methods

A consecutive series of 129 patients undergoing primary elective total hip arthroplasty at our institution during a 3-month period between May and August 2016 were invited to participate. Postal questionnaires were sent to these patients at 6 weeks postoperatively. Responses received beyond 8 weeks postoperatively were excluded as recall and activity are likely biased by a temporal association. For the same reason, non-responders were not sent follow-up questionnaires.

Questionnaire development

As this is the first study of its type, no validated data-collection tool exists. In our institution patients are advised to adhere to several hip precautions postoperatively (Table 1). Patients

Table 1. Summary of hip precautions

Do not bend your hip more than 90 degrees.
Do not cross your legs or feet.
Do not roll or lie on your unoperated side for the first 6 weeks.
Do not twist your upper body when standing.
Do not internally rotate the hip when turning.
Sleep on your back for first 6 weeks.
Do not drive for first 6 weeks.
Do not use a bath for 3 months.
Only use a shower after 6 weeks.
Use two crutches for 2 weeks and then 1 for the next 4 weeks.
Use aids to put on underwear / socks / shoes for 6 weeks.

who are scheduled for a total hip arthroplasty are invited to attend a “hip class” 2 to 4 weeks before their surgery. This session typically lasts no more than 2 hours and is delivered by trained occupational therapists, physiotherapists, and nurses. The precautions are described along with strategies for adhering to them. This includes demonstrations of how to safely dress including the use of sock aids and dressing sticks, practicing how to get into bed, how to manage stairs, and bathing advice. Following the lesson, all patients have an individual occupational therapy assessment to make necessary modifications to provide safe home furniture heights including the toilet and other washing facilities. The information from the hip class is reiterated during the inpatient stay.

GL observed and noted the patient education sessions, information leaflets, letters of instruction, and advice regarding safe heights for furniture and toilets, and additional instructions from physiotherapists and occupational therapists provided during the hospital stay. Based on this experience, we designed a questionnaire to determine our patients' perceptions of hip precautions (Appendix, see Supplementary data).

We wanted to find out whether patients valued the hip precaution class offered routinely prior to total hip arthroplasty. We also wanted to find out how well patients were able to recall the precautions at 6 weeks postoperatively, and whether any activities had been performed violating the precautions. Finally, we wanted to find out if patients felt the precautions affected their activity level, postoperative recovery, or sleep in any way. The questionnaire was refined in the light of appraisal by surgeons and physiotherapists at our institution, and following a pilot on a small group of patients. We ensured a neutral tone throughout the questionnaire in an attempt not to lead patients to one answer or another.

Ethics, funding, and potential conflicts of interest

Ethical agreement to conduct this service evaluation project was granted locally (#032017JBHip). No financial support has been received relating to this research. No competing interests declared.

How much exercise would you have done without the precautions?

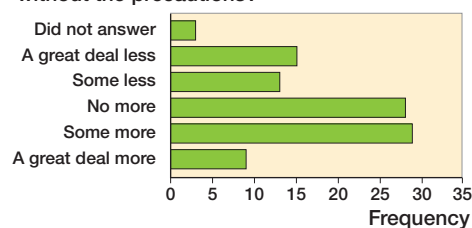


Figure 1. Responses to the question: How much exercise would you have done without the precautions?

How often did you avoid leaving the house because of the precautions?

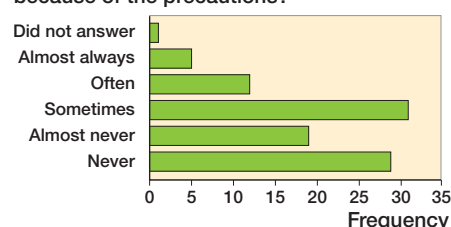


Figure 2. Responses to the question: How often did you avoid leaving the house because of the precautions?

Results

129 patients underwent elective primary hip arthroplasty and received a questionnaire 6 weeks after the surgery. Demographic data including indication for surgery and surgical approach are described in Table 2. We received 97 responses within the subsequent 2 weeks (75% response rate) which were analyzed.

86% of patients felt they could remember most or all of the hip precautions. 72% of patients reported the lesson they received to be very useful with another 19% stating it was quite useful, 3% stated it was slightly useful, and less than 1% stated it was not useful (the remaining 5% did not answer). The lesson caused some degree of anxiety in 48% but did not induce any anxiety in the remaining 47% of patients who answered.

We asked about activities that would represent a violation of the precautions. During the first 6 weeks 46% of patients did not use aids to put on their shoes, 50% of patients did not use aids or help to put on their underwear, and 39% of patients started walking without a stick or aid, all violating the precautions. 22% of patients put their own socks on without aids before 6 weeks postoperatively, and 11 patients stated they had started driving prior to 6 weeks postoperatively, again in violation of the precautions. 36% of patients reported that they had stopped using the recommended-height toilet seat before 6 weeks while 3% said they could not remember how to get into bed as instructed.

Two-thirds of the patients claimed that the precautions stopped them doing what they wanted to do after their THA, with 39% of patients saying they would have done some or

Table 2. Study demographics

	Responders (n = 97)	Non-responders (n = 32)	p-value ^a
Female (%)	68	56	–
Dislocations	0	1	–
Mean age, years (SD)	72 (12)	65 (16)	0.03
Mean ASA (SD)	2.3 (0.5)	2.4 (0.8)	0.7
Mean BMI (SD)	30 (6)	30 (6)	0.9
Indication, n			
Idiopathic osteoarthritis	84	28	–
Osteoarthritis secondary to:			
Inflammatory arthritis	4	0	–
Avascular necrosis	5	2	–
Acetabular dysplasia	2	1	–
Perthes	1	0	–
Hypophosphatemic rickets	0	1	–
Hypochondroplasia	1	0	–
Approach, n			
Posterior	91	30	–
Lateral	6	2	–

^a 2-tailed t-test assuming unequal variance

a great deal more exercise (Figure 1), and 69% of patients avoided leaving the house at some point during the first 6 weeks because of the precautions they were following (Figure 2). Most patients (87%) stated that the precautions interfered with sleep, with 18% being affected every night.

Only 23% of responders stated that they followed all the hip precautions for 6 weeks postoperatively.

Patients who responded to our postal questionnaire within the timeframe were more elderly than non-responders ($p = 0.03$), but were similar in ASA, BMI, approach, and sex (Table 2). 1 dislocation occurred in the non-responder group whilst bending over, with none occurring within the responders during the first 8 weeks postoperatively. Subgroup analyses showed the patients over 70 years old reported worse recall of the precautions, more sleep disturbance, and avoided leaving the house more because of the precautions.

Discussion

Our study suggests that hip precautions may have a detrimental impact on the rehabilitation of patients. Patients reported that adhering to our hip precautions limited their ability to carry out desired activities, caused sleep disturbance, and made them reluctant to leave the house.

Sleep was affected in nine-tenths of patients. We did not ask about the specific cause of the sleep disturbance, but lying supine was often anecdotally cited as problematic by many patients. In a qualitative study of patients' views 6 weeks after hip or knee replacement, all patients complained about inability to sleep during the first weeks, citing instructions to lie supine as the cause (van Egmond et al. 2015). Poor-quality sleep has been shown in similarly aged populations to cor-

relate with decreased Mental and Physical Component Summary scores of the SF-36 questionnaire (Schubert et al. 2002). Creameans-Smith et al. (2006) found that sleep disruptions in the first month after knee replacement can be an independent predictor of 3-month functional limitations. In the short term (< 5 days) continuous periods of sleep were found to be important for both healing and patient well-being (Krenk et al. 2012, Myoji et al. 2015).

Peak et al. (2005) found that patients were much more satisfied, slept better, and returned to ADLs faster when given reduced hip precautions in the postoperative period. In their study, patients were asked to restrict hip flexion to 90 degrees, external rotation to 45 degrees, and avoid abduction for 6 weeks. The control group used raised toilet seats and chairs, were not allowed to sleep on their side, and were instructed not to drive or be a passenger in a car. In addition to these studies, Ververeli et al. (2009) found that removing hip flexion and car travelling restrictions resulted in accelerated rehabilitation as demonstrated by earlier returns to ambulating without a stick, and an earlier return to driving. In accordance with these studies, two-thirds of our patients stated that the precautions stopped them doing what they wanted to do after THA, and a greater proportion avoided leaving the house due to the precautions.

We were interested to see whether there are particular precautions that patients have difficulty following. Patients were able to adhere to a selection of the precautions with the majority of patients (62%) reporting that they were still using the recommended height toilet seat while 97% said they were still able to get into bed as instructed. In contrast, several questions revealed that patients were deviating from the precautions by getting in and out of a bath, putting on their underwear without aids, and sleeping on their sides. To put on underwear without help or aids would usually require the patient to flex their hip beyond 90 degrees. 50% of the patients were putting on their own underwear unaided within 5 weeks while 30% had used a non-adapted bath. In addition, 26% had started sleeping on their side and 40% had starting walking without a stick or aid within 6 weeks. 77% of our patients were unable to comply with all the precautions within the first 6 weeks of a hip arthroplasty.

Dislocation occurs following approximately 1–3% of modern primary total hip replacements (Berstock et al. 2015), therefore a sample size of approximately 4,000 THAs would be required for a randomized controlled trial to determine whether dislocation rates differ between precaution and non-precaution groups (Kornuijt et al. 2016). Despite this, several cohort studies have failed to identify a benefit to hip precautions (Peak et al. 2005, Krenk et al. 2012, Gromov et al. 2015, Kornuijt et al. 2016). A systematic review and meta-analysis including 1,122 procedures (528 with strict precautions and 594 with relaxed precautions) showed no difference in dislocation rate; however, there was an earlier resumption of ADLs and increased patient satisfaction in the relaxed pre-

caution group (van der Weegen et al. 2016). Reducing the period of precautions from 6 to 4 weeks was not associated with an increase in the incidence of dislocation (Schmidt-Braekling et al. 2015). A recent study which abandoned sleeping restrictions and employed normal toilet and chair heights but disallowed combined flexion, internal rotation and adduction found no difference in dislocation when compared with a standard protocol group (Kornuijt et al. 2016). A study of 2,764 THAs given no functional restrictions postoperatively was unable to identify a difference in dislocation rate when compared with those given standard restrictions (Restrepo et al. 2011). The 90-day rate of dislocation did not change in Denmark after precautions were abandoned in the primary hip setting (Gromov et al. 2015).

Additionally, abandoning precautions has an economic benefit. Peak et al. (2005) estimated that \$655 per patient was saved due to the lack of need for additional equipment and devices such as an elevated toilet seat. This does not include the additional loss to the economy caused by delayed returns to work.

In summary, routine use of hip precautions in the primary setting appears unnecessary and potentially detrimental.

Supplementary data

The questionnaire is available as supplementary data in the online version of this article, <http://dx.doi.org/10.1080/17453674.2017.1350008>

JB was responsible for the concept. GL and JB designed the questionnaire. GL was responsible for all data collection, data analyses, and manuscript drafting. All the authors were responsible for interpretation of the data and performed critical revision of the manuscript.

Acta thanks Antti Eskelinen and Gunnar Flivik for help with peer review of this study.

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